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| 09/811,824 | 03/20/2001 | George P. Anderson | 01997-282001 / MIT Case 8 | 8422 |

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FISH & RICHARDSON PC
225 FRANKLIN ST
BOSTON, MA 02110

| EXAMINER | |
|---|---|
| KAM, CHIH MIN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1653 | |

DATE MAILED: 02/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/811,824 | ANDERSON ET AL. | |
| | Examiner | Art Unit | |
| | Chih-Min Kam | 1653 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-56,59 and 60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-56,59 and 60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Status of the Claims*

1. Claims 1-56, 59 and 60 are pending.

Applicants' amendment filed November 7, 2003 is acknowledged, and applicants' response has been fully considered. Claims 13, 29 and 47 have been amended, claims 57 and 58 have been cancelled, and new claims 59 and 60 have been added. Thus, claims 1-56, 59 and 60 are examined.

### ***Rejection Withdrawn***

### *Claim Rejections - 35 USC § 112*

2. The previous rejection of claims 4-7 and 38-41 under 35 U.S.C. 112, second paragraph, is withdrawn in view of applicants' amendment of the claim, and applicants' response at page 19 in the amendment filed November 7, 2003.

### *Claim Rejections - 35 USC § 102*

3. The previous rejection of claims 1-5, 8-12, 15, 35-39, 42-46 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Mirkin *et al.* (WO 98/04740, February 1998), is withdrawn in view of applicants' response at pages 19-20 in the amendment filed November 7, 2003.

### *Claim Objections*

4. Claims 3, 4, 7, 23, 37, 38 and 41 are objected to because the claim contains recitation of non-elected semiconductor materials, e.g., a Group II-V compound for claims 3, 23, 37; AlN for claims 4, 7, 38 and 41.

In response, applicants indicate these claims read on the elected species, and should be maintained in this application. The response has been considered, however, the argument is not

found persuasive because the non-elected items cited in the claims are withdrawn from consideration, and it is suggested these items should be deleted from the claims.

***Claim Rejections-Obviousness Type Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49 and 50 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10, 16-18, 29-32, 37, 38 and 45-57 of U. S. Patent 6,306,610. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49 and 50 in the instant application discloses a composition comprising an inorganic particle, a linking group which binds to the outer surface of the inorganic particle and has a first ionizable moiety, and a macromolecule having a second ionizable moiety, wherein the first and the second ionizable moieties associate the inorganic particle with the macromolecule to form an ionic conjugate, and a method of forming the ionic conjugate. This is obvious in view of claims 1-10, 16-18, 29-32, 37, 38 and 45-57 of the patent which discloses a composition comprising a first member of a binding pair; a semiconductor nanocrystal core linked to the first member, and an outer layer including a ligand comprising a multidentate molecule or a molecule

having formula of $H_zX((CH_2)_nCO_2H)_y$, where the link between the first member of a binding pair and the nanocrystal comprising a linking group for attachment to the nanocrystal and a second portion comprising a hydrophilic group such as a carboxylate, a sulfonate, a phosphate, a hydroxide or an alkoxide, which links to the first member by hydrophilic or electrostatic interaction, and the first member can be a protein. Both the claims of instant application and the claims of the patent are directed to a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable moiety, wherein the nanocrystal associates with the macromolecule via ionic interaction. Thus, claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49 and 50 in present application and claims 1-10, 16-18, 29-32, 37, 38 and 45-57 of the patent are obvious variations of a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable moiety, the nanocrystal and the macromolecule form an ionic conjugate.

In response, applicants indicate claims 1-10, 16-18, 29-32, 37, 38 and 45-57 of the '610 patent are directed to compositions including a first member of a binding pair linked to a semiconductor nanocrystal, and the patent describes the "binding pair" as first and second molecules that specifically bind to each other, and the "specific binding" described in the patent is not the electrostatic association as indicated in the claims of instant application (pages 14-15 of the response). The response has been considered, however, the argument is not found persuasive because the claims 1-7 of '610 patent describe a composition comprising a first member of a binding pair is linked to a semiconductor nanocrystal via a lingand having a formula of $H_zX((CH_2)_nCO_2H)_y$, where the ligand includes a first portion comprising a linking

group, which is attached to the nanocrystal, and a second portion comprising a hydrophilic group (e.g., carboxyl group), which is linked to the first member of the binding pair (e.g., a protein), and the interaction between the nanocrystal and the first member of the binding pair can be hydrophilic or electrostatic interaction, thus, the claims of '610 patent does cite a linking group ($H_zX((CH_2)_nCO_2H)_y$) having one end containing an ionizable group (e.g., carboxyl group), which is electrostatically associated with a macromolecule (e.g., a protein) as the first member of the binding pair, and the other end linked to the nanocrystal. The specific binding of the first member to the second member of the binding pair is not considered here.

6. Claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-72 of U. S. Patent 6,326,144. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 in the instant application discloses a composition comprising an inorganic particle, a linking group which binds to the outer surface of the inorganic particle and has a first ionizable moiety, and a macromolecule having a second ionizable moiety, wherein the first and the second ionizable moieties associate the inorganic particle with the macromolecule to form an ionic conjugate, and a method of forming the ionic conjugate. This is obvious in view of claims 1-72 of the patent which discloses a composition comprising a compound; a semiconductor nanocrystal linked to the compound by a ligand of the formula of $H_zX((CH_2)_nCO_2H)_y$, wherein the compound can be a protein, a peptide or a nucleic acid, and wherein the link between the compound and the nanocrystal is through hydrophilic or electrostatic association, and the compound has an affinity for a biological target, and the affinity of the compound to the

biological target can be hydrophilic or electrostatic attraction. Both the claims of instant application and the claims of the patent are directed to a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable moiety, wherein the nanocrystal associates with the macromolecule (e.g., a protein) via ionic interaction. Thus, claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 in present application and claims 1-72 of the patent are obvious variations of a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a macromolecule having an ionizable moiety, wherein the nanocrystal and the macromolecule have ionic interaction.

In response, applicants indicate the claims of the '144 patent teach only a compound having an affinity for a biological target that is linked to a semiconductor nanocrystal by a ligand formula $H_zX((CH_2)_nCO_2H)_y$, they do not teach using a linking group having a proximal end including a first charged or ionizable moiety to associate an inorganic particle with a macromolecule having a second charged or ionizable moiety (pages 15-16 of the response). The response has been considered, however, the argument is not found persuasive because the claims (e.g., 1, 8-11, 28-30) of '144 patent describe a composition comprising a compound is linked to a semiconductor nanocrystal via a lingand having a formula of $H_zX((CH_2)_nCO_2H)_y$, where the ligand includes a first end linked to the nanocrystal, and a second end (e.g., carboxyl group) linked to the compound (e.g., a protein), and the interaction between the nanocrystal and the compound can be hydrophilic or electrostatic interaction, thus, the claims of '144 disclose a ligand ($H_zX((CH_2)_nCO_2H)_y$) having one end containing an ionizable group (e.g., carboxyl

group), which is electrostatically associated with a compound (e.g., a protein), and the other end linked to the nanocrystal.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-56, 59 and 60 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a composition comprising a semiconductor nanocrystal, a linking group which binds to the outer surface of the nanocrystal and has an ionizable moiety, and a protein having an ionizable moiety, wherein the nanocrystal and the protein are linked by an identified linking group to form an ionic conjugate, and a method of forming the ionic conjugate; or a composition comprising a fluorescent semiconductor nanocyrstal, associated with a compound that has affinity and can physically interact with a biological target as indicated in the prior art, does not reasonably provide enablement for a composition comprising an inorganic particle, a linking group which binds to the outer surface of the inorganic particle and has an ionizable moiety, and a macromolecule having an ionizable moiety, wherein the inorganic particle and the macromolecule are linked by a linking group to form an ionic conjugate, and a method of forming the ionic conjugate, where the inorganic particle, the linking group and the macromolecule are not defined. The specification does not enable a person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Claims 1-56, 59 and 60 are directed to a composition comprising an inorganic particle, a linking group, and a macromolecule or a fusion protein, wherein the inorganic particle and the macromolecule are linked by the linking group to form an ionic conjugate (claims 1-34), and a method of forming the ionic conjugate (claims 35-56, 59 and 60). The specification, however, only discloses cursory conclusions without data supporting the findings, which states that the inventions relates to ionic conjugates including inorganic particles and macromolecules useful in detecting the presence or absence of specific species such as for detecting a biological target, and an ionic conjugate forms through self-assembly in which inorganic particles electrostatically associate with at least one macromolecule (page 1, lines 11-13; page 2). There are no indicia that the present application enables the full scope in view of an ionic conjugate comprising an inorganic particle, a linking group, and a macromolecule, and a method of making the ionic conjugate as discussed in the stated rejection. The present application provides no indicia and no teaching/guidance as to how the full scope of the claims is enabled. The factors considered in determining whether undue experimentation is required, are summarized in In re Wands (858 F2d at 731,737, 8 USPQ2d at 1400,1404 (Fed. Cir.1988)). The factors most relevant to this rejection are the breath of the claims, the absence of working examples, the state of the prior art and relative skill of those in the art, the unpredictability of the art, the nature of the art, the amount of direction or guidance presented, and the amount of experimentation necessary.

(1). The breadth of the claims:

The breadth of the claims is broad and encompasses unspecified variants regarding inorganic particles, the linking group and the macromolecules in the ionic conjugates, where the make/use are not adequately described or demonstrated in the specification.

(2). The absence or presence of working examples:

There are no working examples indicating the claimed variants except for an ionic conjugate of semiconductor nanoparticles (CdSe-ZnS-dihydrolipoic acid) with Maltose binding protein (MBP)-leucine zipper fusion protein or with protein G-leucine zipper fusion protein (pages 22-29).

(3). The state of the prior art and relative skill of those in the art:

The prior art indicates a composition comprising a fluorescent semiconductor nanocyrstal associated with a compound that has affinity and can physically interact with a biological target (Bawendi *et al.*, U. S. Patents, 6,306,610 and 6,326,144). However, the general knowledge and level of the skill in the art do not supplement the omitted description, the specification needs to provide more teachings on the make and use of ionic conjugates containing various inorganic particles, various linking groups, and various macromolecules to be considered enabling for the claimed method.

(4). Predictability or unpredictability of the art:

The specification has shown the make of ionic conjugates of semiconductor nanoparticles (CdSe-ZnS) with Maltose binding protein (MBP)-leucine zipper fusion protein or with protein G-leucine zipper fusion protein (pages 22-29). However, the specification does not provide the make/use of ionic conjugates containing various inorganic particles, various linking groups and various macromolecules, the invention is highly unpredictable regarding the effects of these ionic conjugates.

(5). The amount of direction or guidance presented and the quantity of experimentation necessary:

The claims are directed to an ionic conjugate comprising an inorganic particle, a linking group, and a macromolecule or a fusion protein, and a method of forming the ionic conjugate. The specification has shown the make of ionic conjugates of semiconductor nanoparticles (CdSe-ZnS-dihydrolipoic acid) with Maltose binding protein (MBP)-leucine zipper fusion protein or with protein G-leucine zipper fusion protein (pages 22-29). However, the specification has not demonstrate the making and use of various ionic conjugates containing different inorganic particles, different linking groups and different macromolecules. There is no working example indicating the claimed variants except for an ionic conjugate of a semiconductor nanoparticle (CdSe-ZnS-dihydrolipoic acid) with a fusion protein. The specification has not provided sufficient teachings on the make/use of various ionic conjugates, which are encompassed by the claims. Since the specification fails to provide sufficient teaching on the make/use of ionic conjugates containing various inorganic particles, linking groups and macromolecule, it is necessary to carry out further experimentation to assess the effects of various ionic conjugates in biological use.

(6). Nature of the Invention

The scope of the claims encompasses various ionic conjugates, but the specification does not provide sufficient teachings on the make/use of these ionic conjugates and the effects of these conjugates. Thus, the disclosure is not enabling for the reasons discussed above.

In summary, the scope of the claim is broad, the working example does not demonstrate the claimed variants, the art is unpredictable regarding the effects of the conjugates, and the teaching in the specification are limited, therefore, it is necessary to have additional guidance and to carry out further experimentation to assess the effects of these ionic conjugates.

In response, applicants indicate inorganic particles are described at pages 9-10, additional semiconductor nanocrystals at pages 10-14, and macromolecules at page 14, thus the claims are commensurate in scope with the teachings of the specification; regarding working examples, the specification provides two working examples of ionic conjugates (pages 22-23), and it is not necessary to provide a working example for every embodiment encompassed by the claims; the disclosure enables of the full scope of the claims, and there is no omitted description; the effects of the ionic conjugates and the predictability of the those effects are not relevant to the question of enablement; the Examiner has not shown the specification provides insufficient direction or guidance to enable a person skilled in the art; and the Examiner has not indicated why the disclosure is not enabling (pages 14-22 of the response). The response has been fully considered, however, the argument is not found persuasive because the claims are directed to an ionic conjugate comprising an inorganic particle, a linking group and a macromolecule, where the inorganic particle, the linking group and the macromolecule are not identified, while the specification only disclose the make/use of an ionic conjugate comprising a semiconductor nanocrystal and a protein, which are linked by an identified linking group (e.g., ionic conjugates of a CdSe-ZnS semiconductor nanoparticle with a fusion protein), it does not disclose how to make and use unidentified ionic conjugates containing an inorganic particle, a linking group and a macromolecule with various structural features, which are encompassed by the claims but not described in the specification. Thus, the full scope of the claim is not enabled. As indicated in the section above, the description of inorganic particles and macromolecules (pages 9-14), and the working examples (pages 22-23) in the specification are mainly directed to an ionic conjugate comprising a semiconductor nanocrystal, which can be used for detecting a biological

target (page 1, lines 11-13), however, the claims are directed to unidentified ionic conjugates containing various inorganic particles, linking groups and macromolecules, where the make, the effect, and the use of these conjugates are not described in the specification, thus, it requires additional guidance to carry out further experimentation to assess the effects of these ionic conjugates in biological use.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 1-9, 11-13, 15, 16, 35-43, 45-47, 49 and 50 are rejected under 35 U.S.C. 102(e) as being anticipated by Bawendi *et al.* (U. S. Patent 6,306,610, filed September, 1999).

Bawendi *et al.* teach a composition comprising a fluorescent semiconductor nanocrystal having an overcoating layer, associated with a compound that has affinity and can physically interact with a biological target such as proteins, nucleic acids, cells and subcellular organelles, wherein the affinity is hydrophilic, ionic or electrostatic attraction (column 4, line 7-column 5,

line 8; claims 1, 2, 15, 16, 35, 36, 49 and 50), and wherein the compound having at least one linking group attached to the overcoating layer and at least one hydrophilic group has the structural formula (I), (II), (III) or (IV), where the hydrophilic group may be a charged group such as carboxylates, sulfonate, phosphates or ammonium salts (column 15, line 66-column 18, line 53; claims 8, 9, 11-13, 42, 43 and 45-47). The semiconductor nanocyrstal includes a core surrounded by a semiconductor shell, and the core and the shell can be a semiconductor material including those of Group II-VI, e.g., CdSe and ZnS (column 6, lines 14-37; claims 3-7 and 37-41).

In response, applicants indicate the compounds of '610 patent having formula I, II, III or IV are described as water solubilizing compounds (column 16, lines 11-13), these compounds do not have a first charged or ionizable moiety that electrostatically associates with a second charged or ionizable moiety of a macromolecule (page 21 of the response). The response has been fully considered, however, the argument is not found persuasive because the compounds having formula I, II, III or IV are used to link the nanocrystal to prepare water soluble semiconductor nanocrystal (Example 2, Fig. 4), which can be linked to a first member of the binding pair via ionic interaction (column 7, lines 8-18; claims 1-7 of '610 patent), thus, the claimed invention is anticipated by the reference.

10. Claims 1-5, 8, 9, 11-12, 15, 16, 35-39, 42, 43, 45-46, 49 and 50 are rejected under 35 U.S.C. 102(e) as being anticipated by Bawendi *et al.* (U. S. Patent 6,326,144, filed September, 1998).

Bawendi *et al.* teach a composition comprising a fluorescent semiconductor nanocrystal having an overcoating layer, associated with a compound that has affinity and can physically

interact with a biological target such as proteins, nucleic acids, cells and subcellular organelles, wherein the affinity is hydrophilic, ionic or electrostatic attraction (column 3, line 31-column 4, line 4; claims 1, 2, 15, 16, 35, 36, 49 and 50), and wherein the compound having at least one linking group attached to the overcoating layer and at least one hydrophilic group, has the structural formula $H_zX((CH_2)_nCO_2H)_y$, where the hydrophilic group is carboxylate (column 7, line 66-column 8, line 51; claims 8, 9, 11-12, 42, 43 and 45-46). The semiconductor nanocrystal includes semiconductor materials of Group II-VI, e.g., CdSe and ZnS (column 6, lines 14-37; claims 3-5 and 37-39).

In response, applicants indicate the compounds of '144 patent having $H_zX((CH_2)_nCO_2H)_y$ are described as water solubilizing compounds (column 7, line 66 –column 8, line 59), these compounds do not have a first charged or ionizable moiety that electrostatically associates with a second charged or ionizable moiety of a macromolecule (pages 21-22 of the response). The response has been fully considered, however, the argument is not found persuasive because the compounds having $H_zX((CH_2)_nCO_2H)_y$ are used to link the nanocrystal to prepare water soluble semiconductor nanocrystal (Example 2, Fig. 4), which can be linked to a biological molecule such as a protein via ionic interaction (column 6, lines 34-53; claims 1, 8-12 of '144 patent), thus, the claimed invention is anticipated by the reference.

***Conclusion***

11. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Min Kam whose telephone number is (571) 272-0948. The examiner can normally be reached on 8.00-4:30, Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Low can be reached on (571) 272-0951. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 308-4227 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Chih-Min Kam, Ph. D. CMK
Patent Examiner

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February 12, 2004

Christopher S. F. Low
CHRISTOPHER S. F. LOW
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600